

PV-ESS All-in-One System

* VPP * Self-consumption * Off-grid operation (black start)



• Overview

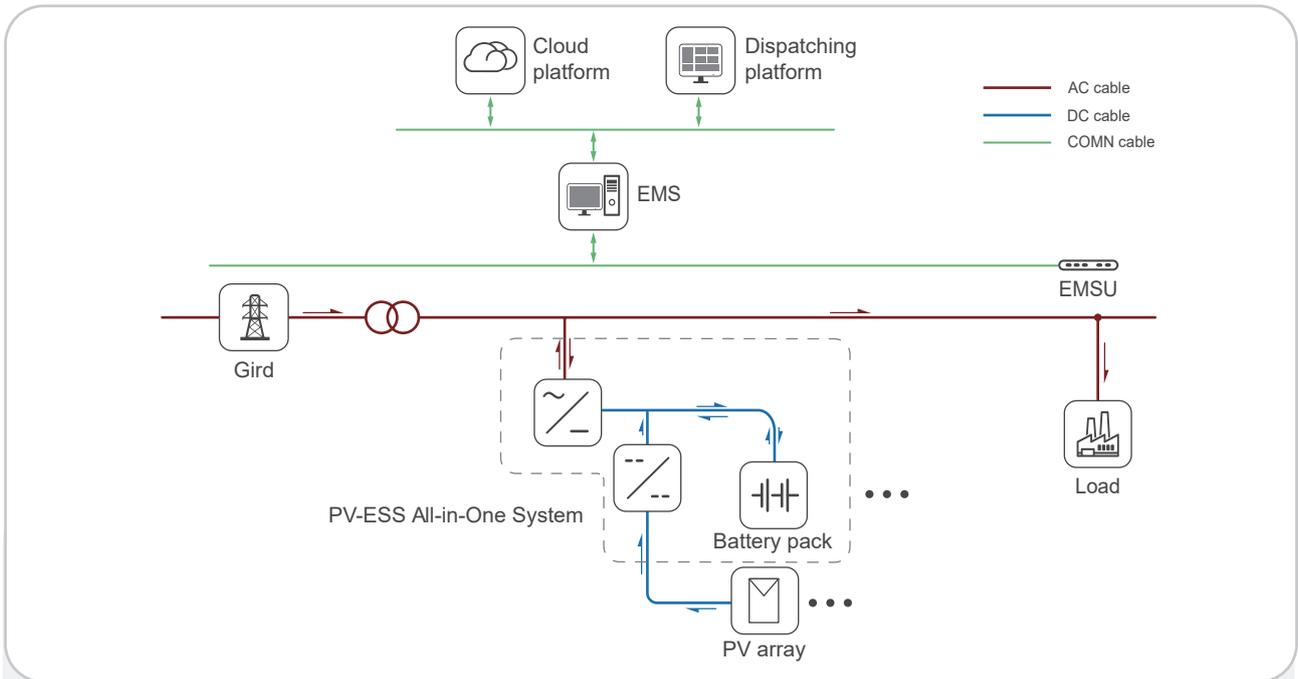
This system adopts a DC-coupling architecture and anti-backflow design, integrating energy management system (EMS), bidirectional inversion, MPPT PV control, and a high-precision Battery Management System (BMS). It is equipped with long-cycle LFP batteries to form an integrated energy storage unit.

The system executes the intelligent energy scheduling strategy on a 24-hour cycle: solar power is prioritized for on-site consumption, with surplus energy stored. During insufficient sunlight or high electricity prices, the battery discharges to support the load, achieving "self-generation and self-consumption, surplus storage."

Additionally, the system features virtual power plant (VPP) node functionality, enabling remote response to grid dispatch and participation in services such as peak shaving demand response. In the event of grid anomalies, it can switch to off-grid mode to ensure local power supply.

Through the coordinated operation of generation, storage, consumption, and grid interaction, the system ultimately delivers 3 core values: improved energy economics, enhanced power reliability, and support for grid stability—providing users with an efficient, flexible, and resilient green energy solution.

• System Topology

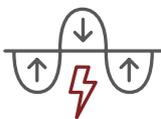


Applicable Equipment:



PV-ESS All-in-One System

• Applications



Peak shaving



Black start capability



Emergency power supply



Electricity trading

PV-ESS-Charging All-in-One System

* VPP * Modular Integration * Renewable energy consumption

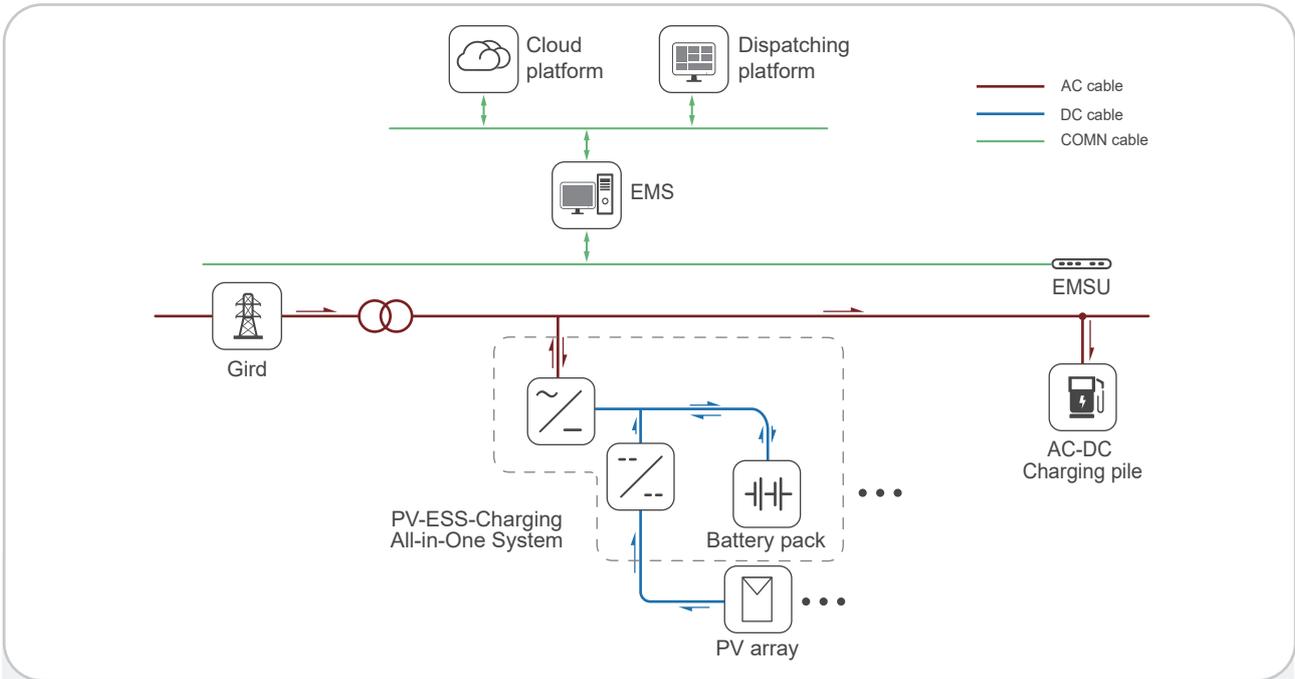


• Overview

This system is an integrated " PV-ESS-Charging " smart energy station that deeply integrates PVpower generation, energy storage, and intelligent charging. Its core lies in the dynamic coordination and optimized dispatch of these 3 components through a smart Energy Management System (EMS). It utilizes PV generation for local consumption of green electricity, relies on the energy storage system for "peak shaving" as well as grid interaction, effectively mitigates charging load fluctuations, and enhances grid regulation capabilities and energy utilization efficiency.

The system not only reduces charging costs and carbon emissions but also functions as a grid-friendly node with the potential to participate in demand response and Virtual Power Plant (VPP) operations. It serves as a key infrastructure solution supporting the large-scale development of electric vehicles in scenarios with a high penetration of renewable energy.

• System Topology



Applicable Equipment:

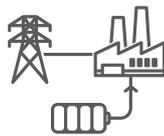


PV-ESS-Charging All-in-One System

• Applications



Capacity stability



Time-of-use optimisation



Ancillary services



Self-Generation and Self-Consumption

BESS-T

PV-ESS All-in-One System

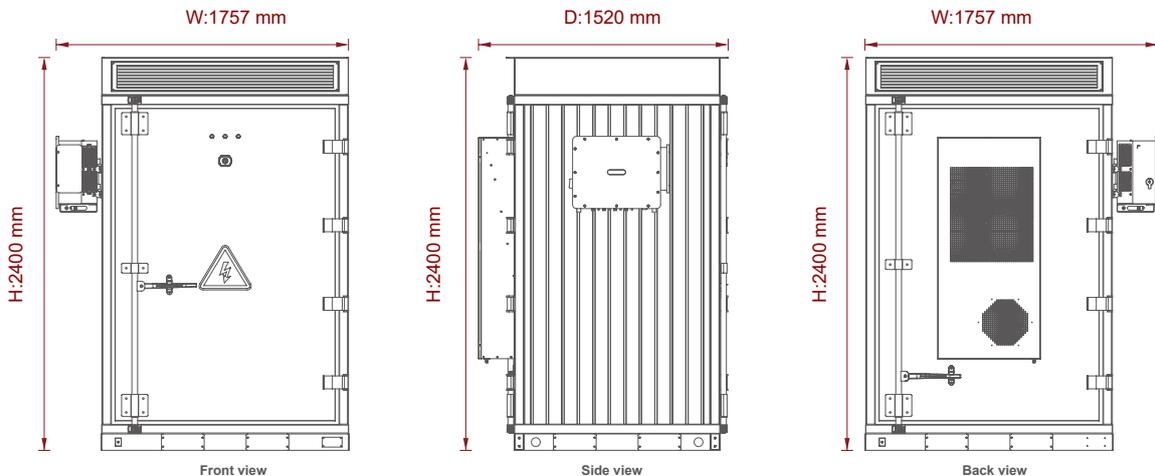
BESS-T 125-271-120W



• Features

- Two level BMS built-in.
- Intelligent thermal management system
- IP55 fire and explosion proof cabinet.
- Fire proof devices in each modular and in the cabinet.
- Easy for on site installation.
- Supports multi-level priority control to ensure reliable power supply from the grid and photovoltaic sources.

• Product Dimensions




• Technical Parameter

BESS-T 125-271-120W		
Battery Parameters		
Battery Module	Voltage	57.6V
	Capacity	314 Ah
	Energy	18 kWh
	Cooling method	Dry Self-Cooling
Battery Cluster	Rated voltage	864V
	Grouping method	1P 270 S
	Rated capacity	314 Ah
	Output voltage range	756V~950V
	Rated energy	271kWh
	Max continuous charging current	157 A
	Max continuous discharge current	157 A
AC Side		
PCS Parameter	Rated current	181A
	PCS overload capacity	x1.1 continuous;x1.25(30ms)
	PCS output power	125kW
	Maximum continuous output power	137.5kW
	Total THDi	≤3%
	Maximum efficiency	≥98.5%
	AC-side voltage of PCS	3P3W+PE/3P4W+PE, 400 V
	Frequency	50Hz/60Hz
	Power factor	-1~1
	Battery side voltage	600V-950 VA
MPPT Parameter	PV side	
	Maximum photovoltaic array voltage	No more than 900V and no higher than the maximum tolerance voltage of the rear battery.
	MPPT voltage range	200V-900V
	Rated MPPT voltage range	560V-900V
	Maximum branch current	20A
	PV input strings number	12
	High voltage side	
	Voltage range	600-950V
	Rated voltage	Default 716.8V, adjustable
	Rated output current	168A
	Rated output power	120kW
	Maximum output current	240A
	System Parameter	
	IP grade	IP65
Cooling concept	Air cooling	
Dimensions (W*D*H)	610*480*257 mm	
Weight	30kg	
Working temperature	-30 ~ 55 °C	
System Parameter		
System Parameter	Dimension(W*D*H)	1757*1520*2400mm
	Weight(kg)	/
	Display	7-inch Resistive Touch Screen
	Fire protection systems	Aerosol Fire Module
	Degree of protection	IP55
	Certification	CE;IEC62619;UN38.3
	Working temperaturerange	-30~60°C(> 45°C derating)
	Cooling	Dry Self-Cooling
	Relative humidity	5~95%(No Condensing)
	Storage temperature(<6month)	0~35°C
	Short-term storage temperature(<1month)	-20~55°C
	Highest altitude	4000m(>2000m derating)

MPPT

PV MPPT Controller MPPT-12



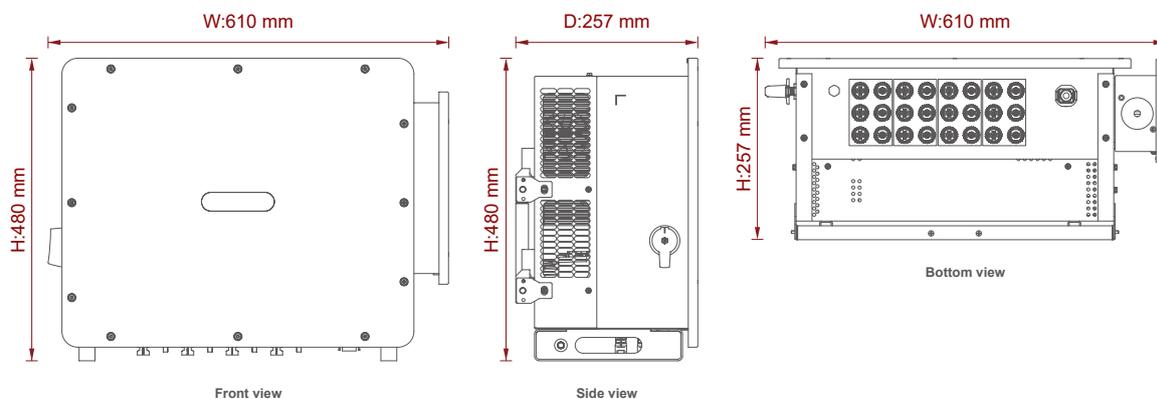
• Features

- Multiple MPPT for flexible PV installation angles.
- Insulation resistance monitoring with optional PID.
- Comprehensive protection: short circuit, reverse polarity & over-temperature.
- Compact design, small size, easy installation.
- Smart fan control for low noise and high efficiency.
- Built-in secondary surge protection for enhanced safety.
- IP66 & C5 anti-corrosion, ideal for coastal high-salt environments.

• Product Introduction

The **MPPT controller** is used to build a DC-coupled system that tracks the maximum power point in the solar panel in real time to maximize the performance of the solar panel. The higher the voltage, the more electricity can be output through maximum power tracking, thereby improving the charging efficiency.

• Product Dimensions



• Technical Parameter

MPPT-12	
Input	
Maximum photovoltaic array voltage	No more than 900V and no higher than the maximum tolerance voltage of the rear battery.
MPPT voltage range	200V-900V
Rated MPPT voltage range	560V-900V
Maximum branch current	20A
PV input strings number	12
Number of MPPT	4
Current per MPPT	55A
Output	
Voltage range	600-950V
Rated voltage	Default 716.8V, adjustable
Rated output current	168A
Rated output power	120kW
Maximum output current	240A
System	
EU efficiency	0.994
IP grade	IP65
Cooling concept	Dry Self-Cooling
Dimensions (W*D*H)	610*480*257 mm
Weight	30kg
Working temperature	-30 ~ 55 °C
Power supply modes	Self-powered (without power consumption at night)
Communication interface	RS485

PCS

Industrial & Commercial Energy Storage Converter Sic PCS



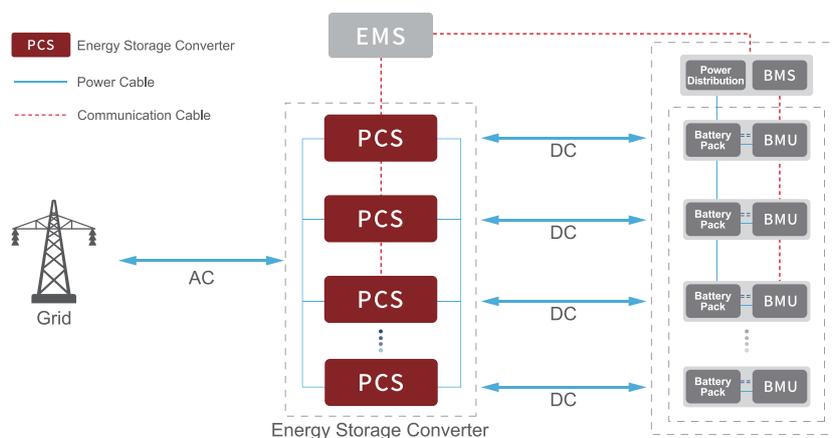
• Features

- High-efficiency bidirectional AC/DC conversion (up to 99.1%) with full potting and strong reliability.
- 100% three-phase unbalanced load capability and excellent grid adaptability.
- Compact 3U design with low standby loss and easy installation.
- Supports AC parallel expansion, hot-swap maintenance, and 3P3W/3P4W operation.
- Wide voltage range compatible with 280Ah–300+Ah battery cells.

• Product Introduction

The PCS energy storage converter is a bidirectional power module for AC-DC power conversion that supports both grid-connected mode and off-grid mode. It can control the battery charging and discharging according to EMS instructions, perform intelligent mode switching, and adapt to large capacity cells such as 280Ah, 314Ah, and 320Ah. PCS has the functions such as overvoltage protection, overcurrent protection, overload protection, short circuit protection, over temperature protection, high/low voltage crossing, and island protection. When combined with STS, it can achieve seamless switching between grid connection and off-grid, which is suitable for peak shaving and valley filling in commercial and industrial parks, responding to demand, and building microgrids with wind and photovoltaic power generation equipment and diesel generators.

• System Topology




• Technical Parameter

PCS Energy Storage Converter		
Model	PCS950-125KCBMG	PCS950-105KCBMG
DC Parameters		
Rated Power	125KVA	105KVA
Voltage Range	600~950VDC(625~950VDCfull-load operation)	
Stabilized Voltage Predision	±1%±	
Stabilized Current Precision	±1%	
Maximum Current	210A	175A
AC Grid Connection		
Rated Power	125KVA	105KVA
Maximum Power	137.5KVA(continuous)	115.5KVA(continuous)
Wiring Mode	3P3W+PE/3P4W+PE	
Rated Voltage	400VAC	
Voltage Range	340~460VAC,340~400VAC linear derating	
Maximum Current	198.5A	167A
Voltage Frequency	50/60±5Hz	
Power Factor	[-1 , 1]	
THDi	≤3%	
Maximium Efficiency	≥99.1%	
AC Off-Grid Parameters		
Rated Power	125KVA	105KVA
Maximum Power	137.5KVA(continuous)	115.5KVA(continuous)
Rated Voltage	400VAC	
Wiring Mode	3P3W+PE/3P4W+PE	
Rated Output Frequency	50/60Hz	
THDu	≤3%	
System Parameters		
Overload Capability	110% (long-term)	
Dimensions(W*D*H)	440mm*130mm*600mm (without hanging ears)	
Weight(kg)	≤40kg	
Level Of Protection	IP20	
Noise	≤75dB	
Working Temperature Range	-30°C~+65°C (>50°C derating)	
Storage Temperature Range	-40°C~+70°C	
Humidity Range	0~98% (no condensation)	
Heat-dissipating Method	Dry Self-Cooling	
Altitude	4000m (>2000m derating)	
Safety Regulations & Standards	CE (IEC 62477-1)	
EMC Standards	CE (IEC 61000-6-2/4)	
Grid Connection Standards	European EN50549-1/-10;Germany VDE4105;UK G99	
Parameter Communication		
PC Terminal	Ethernet (Modbus-TCP);RS485(Modbus-RTU);CAN 2.0	
BMS	RS485;CAN 2.0B	